

Application Serial No.: 10/000,151

IN THE CLAIMS:

1. (Currently amended) A method of identifying a compound that modulates potassium transmission by a potassium channel, comprising:

- (a) providing a structure comprising a biologically active human ether-a-go-go-related gene (HERG) potassium channel polypeptide comprising an amino acid sequence at least 90% identical to SEQ ID NO: 3, wherein the structure comprises a potassium channel polypeptide and a biologically active potassium channel regulator 1 (KCR1) polypeptide comprising an amino acid sequence at least 90% identical to SEQ ID NO: 2;
- (b) contacting the test compound with the structure;
- (c) determining potassium transmission by the HERG potassium channel in the presence of the test compound; and
- (d) comparing the potassium transmission by the HERG potassium channel in the presence of the test compound to potassium transmission by the HERG potassium channel in an absence of the test compound, wherein a difference between potassium transmission by the HERG potassium channel in the absence of the test compound and potassium transmission by the HERG potassium channel in the presence of test compound indicates modulation of potassium transmission by the HERG potassium channel.

2. (Original) The method of claim 1, wherein the structure comprises a cell.

3. (Original) The method of claim 2, wherein the cell is isolated from a subject.

4-8. (Canceled)

9. (Currently amended) The method of claim [[8]] 2, wherein a nucleic acid encoding the human ether-a-go-go-related gene (HERG) potassium channel is heterologous.

10. (Currently amended) The method of claim [[8]] 2, wherein a nucleic acid encoding the human ether-a-go-go-related gene (HERG) potassium channel is polycistronic.

Application Serial No.: 10/000,151

11. (Currently amended) The method of claim 1, wherein the biologically active potassium channel regulator 1 (KCR1) polypeptide is encoded by a nucleic acid selected from the group consisting of comprising SEQ ID NO: 1 and nucleic acids that differ from SEQ ID NO: 1 only by virtue of genetic code redundancy.

12. (Currently amended) The method of claim [[11]] 1, wherein the a nucleic acid encoding the potassium channel regulator 1 (KCR1) polypeptide comprising an amino acid sequence as set forth in SEQ ID NO: 2 is heterologous.

13. (Currently amended) The method of claim [[11]] 1, wherein ~~the~~ a nucleic acid encoding the potassium channel regulator 1 (KCR1) polypeptide comprising an amino acid sequence as set forth in SEQ ID NO: 2 is polycistronic.

14. (Original) The method of claim 1, wherein the determining comprises employing a patch clamp apparatus.

15. (Currently amended) The method of claim 1, wherein potassium transmission by the HERG potassium channel in the presence of a test compound is determined in the presence of a minK-related peptide-1 (MiRP1) polypeptide.

16. (Currently amended) The method of claim 1, wherein the structure further comprises a biologically active minK-related peptide-1 (MiRP1) polypeptide.

17. (Currently amended) The method of claim 16, wherein the biologically active minK-related peptide-1 (MiRP1) polypeptide is encoded by a nucleic acid comprising SEQ ID NO: 4 comprises an amino acid sequence at least 90% identical to SEQ ID NO: 5.

18. (Original) The method of claim 17, wherein the nucleic acid is heterologous.

19. (Original) The method of claim 17, wherein the nucleic acid is polycistronic.

20-99. (Canceled)

Please add the following new claims:

100. (New) A method of identifying a compound that modulates potassium transmission by a potassium channel, comprising:

Application Serial No.: 10/000,151

- (a) providing a structure comprising a human ether-a-go-go-related gene (HERG) potassium channel comprising an amino acid sequence at least 99% identical to the amino acid sequence as set forth in SEQ ID NO: 3 and a potassium channel regulator 1 (KCR1) polypeptide comprising an amino acid sequence at least 99% identical to the amino acid sequence as set forth in SEQ ID NO: 2;
- (b) contacting the test compound with the structure;
- (c) determining potassium transmission by the HERG potassium channel in the presence of the test compound; and
- (d) comparing the potassium transmission by the HERG potassium channel in the presence of the test compound to potassium transmission by the HERG potassium channel in an absence of the test compound, wherein a difference between potassium transmission by the HERG potassium channel in the absence of the test compound and potassium transmission by the HERG potassium channel in the presence of test compound indicates modulation of potassium transmission by the HERG potassium channel.

101. (New) The method of claim 100, wherein the human ether-a-go-go-related gene (HERG) potassium channel comprises an amino acid sequence as set forth in SEQ ID NO: 3.

102. (New) The method of claim 11, wherein the potassium channel regulator 1 (KCR1) polypeptide comprises an amino acid sequence selected from the group consisting of an amino acid sequence as set forth in SEQ ID NO: 2; an amino acid sequence encoded by a nucleic acid molecule comprising a nucleotide sequence as set forth in SEQ ID NO: 1; and an amino acid sequence encoded by a nucleic acid molecule comprising a nucleotide sequence that differs from SEQ ID NO: 1 only by virtue of genetic code redundancy.

103. (New) The method of claim 17, wherein the mink-related peptide-1 (MiRP1) polypeptide is encoded by a nucleic acid comprising a nucleotide sequence at least 99% identical to SEQ ID NO: 4 or that differs from SEQ ID NO: 4 only by virtue of genetic code redundancy.

Application Serial No.: 10/000,151

104. (New) The method of claim 103, wherein the mink-related peptide-1 (MIRP1) polypeptide comprises an amino acid sequence selected from the group consisting of an amino acid sequence as set forth in SEQ ID NO: 5, an amino acid sequence encoded by SEQ ID NO: 4, and an amino acid sequence encoded by a nucleic acid sequence that differs from SEQ ID NO: 4 only by virtue of genetic code redundancy.